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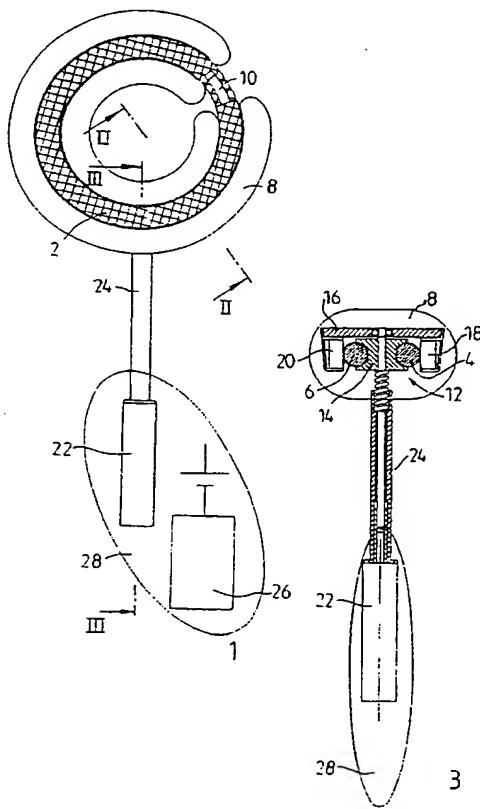
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*[Continued on next page]*

(54) Title: MECHANICAL HEARTBURN AND REFLUX DISEASE TREATMENT APPARATUS



(57) Abstract: A heartburn and reflux disease treatment apparatus for surgical application in the abdomen of a patient comprises an adjustable restriction device (2) adapted to engage the stomach close to the cardia or esophagus to form a restricted food passageway in the stomach or esophagus of the patient. A post-operation adjustment device (12) is designed to mechanically adjust the restriction device, preferably in a non-invasive manner, to enlarge or restrict the food passageway. The treatment apparatus allows post-operation daily adjustments of the restriction device to enlarge the food passageway when the patient eats and to restrict or close the food passageway between meals.

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-- upon request of the applicant, before the expiration of the time limit referred to in Article 21(2)(a)

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 01/00228

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: A61F 5/00 // A61B 17/12**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC7: A61F, A61B**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**SE,DK,FI,NO classes as above**

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5938669 A (KLAIBER ET AL), 17 August 1999 (17.08.99), figure 1, abstract	1-10, 34-36, 44-107, 109-119
A	--	11-33, 37-43, 108, 120
X	US 5771903 A (JAKOBSSON), 30 June 1998 (30.06.98), figure 1, abstract	1
A	--	
A	US 4271827 A (ANGELCHIK), 9 June 1981 (09.06.81), abstract	1-120
	--	

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

&amp; document member of the same patent family

Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.
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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 00/15158 A1 (SOFRADIM PRODUCTION), 23 March 2000 (23.03.00), figures 1-4, abstract  --	1-27, 32, 33, 44
P,X	WO 00/09047 A1 (FORSELL, PETER), 24 February 2000 (24.02.00), figures 1-35  --	1-120
E,X	WO 01/12078 A1 (BLOMBERG, AXEL), 22 February 2001 (22.02.01), abstract  -----	1

**INTERNATIONAL SEARCH REPORT**International application No.  
PCT/SE01/00228**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

... / ...

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

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According to rule 13.2, an international application shall relate to one invention only or a group of inventions linked by one or more of the same or corresponding "special technical features", i.e. features that define a contribution which each of the inventions, considered as a whole, makes over the prior art.

Such a link between all the subject of claims 1-120 would be the post-operation adjustment device designed to mechanically adjust the restriction device. An invention comprising this feature is disclosed in the documents US 5771903 A or US 5938669 A. The documents reveal a restriction band that includes a post-operation adjustment device designed to mechanically (filling a cavity in the band with a liquid) adjust the band.

According the following inventions were found:

1. Claims 1-11, 34-36, 44-120 directed to a heartburn and reflux disease treatment apparatus comprising a post-operation adjustment device designed to mechanically adjust a restriction device.
2. Claims 12-27, 32, 33 directed to a heartburn and reflux disease treatment apparatus, wherein the adjustment device is adapted to adjust the longitudinal extension of an elongated restriction device.
3. Claims 28-31 directed to a heartburn and reflux disease treatment apparatus, wherein the adjustment device is adapted to turn pivoted elements of a restriction device.
4. Claims 37 directed to heartburn and reflux disease treatment apparatus wherein the adjustment device is adapted to pull a first portion of a restriction member from a second of a restriction member opposite the first portion.
5. Claims 38-39 directed to a heartburn and reflux disease treatment apparatus wherein the adjustment device is adapted to squeeze the stomach between two elements.
6. Claims 40-43 directed to a heartburn and reflux disease treatment apparatus wherein the adjustment device is adapted to bend a portion of the stomach or esophagus.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

28/05/01

International application No.

PCT/SE 01/00228

Patent document cited in search report	Publication date		Patent family member(s)		Publication date
US 5938669 A	17/08/99	EP	0876808 A		11/11/98
US 5771903 A	30/06/98	AT	192318 T		15/05/00
		DE	69516690 D,T		01/02/01
		EP	0769282 A,B		23/04/97
US 4271827 A	09/06/81		NONE		
WO 00/15158 A1	23/03/00		NONE		
WO 00/09047 A1	24/02/00		NONE		
WO 01/12078 A1	22/02/01		NONE		

